(12) **United States Patent**
Laakonen et al.

(10) **Patent No.:** **US 10,328,349 B2**
(45) **Date of Patent:** **Jun. 25, 2019**

(54) **SYSTEM AND METHOD FOR MANAGING GAME-PLAYING EXPERIENCES**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 261 days.

(21) Appl. No.: **15/335,996**

(22) Filed: **Oct. 27, 2016**

(65) **Prior Publication Data**

US 2017/0128844 A1 May 11, 2017

Related U.S. Application Data

(60) Continuation of application No. 14/988,813, filed on Jan. 6, 2016, now Pat. No. 9,504,923, which is a
(Continued)

(51) **Int. Cl.**
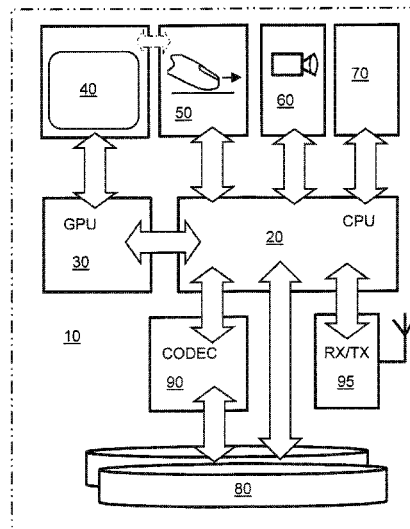*A63F 13/42* (2014.01)
A63F 13/86 (2014.01)
(Continued)

(52) **U.S. Cl.**
CPC *A63F 13/86* (2014.09); *A63F 13/10* (2013.01); *A63F 13/12* (2013.01); *A63F 13/20* (2014.09);
(Continued)

(58) **Field of Classification Search**
CPC A63F 13/86; A63F 13/20; A63F 13/35; A63F 13/49; A63F 13/497; A63F 13/537;

A63F 13/63; A63F 13/10; A63F 13/12; A63F 2300/552; A63F 2300/554; A63F 2300/634; G11B 27/031; G11B 27/105;
(Continued)

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(57) **ABSTRACT**

A system for managing game-playing experiences includes one or more game-playing devices provided with communication interfaces for exchanging game-playing experiences therebetween. Each device includes computing hardware coupled to a graphical interface for presenting an interactive game thereupon. The computing hardware is operable to execute one or more game software products recorded on machine-readable data storage media for generating the interactive game. The one or more game software products include a game experience software module (GESW) for generating metadata concurrently with recording the game-playing experience substantially as presented via the graphical interface which enables the recorded game-playing experience to be subsequently managed prior to communication for distribution for viewing. Optionally, the metadata includes one or more metadata events which are searchable when subsequently viewing the game-playing experience.

19 Claims, 4 Drawing Sheets

Related U.S. Application Data

division of application No. 13/765,708, filed on Feb. 13, 2013, now Pat. No. 9,233,305.

(51) **Int. Cl.**

A63F 13/40	(2014.01)
A63F 13/30	(2014.01)
A63F 13/497	(2014.01)
G11B 27/031	(2006.01)
G11B 27/10	(2006.01)
G11B 27/32	(2006.01)
A63F 13/20	(2014.01)
A63F 13/35	(2014.01)
A63F 13/49	(2014.01)
A63F 13/537	(2014.01)
A63F 13/63	(2014.01)
H04N 21/84	(2011.01)
H04N 21/845	(2011.01)

(52) **U.S. Cl.**
CPC *A63F 13/35* (2014.09); *A63F 13/49* (2014.09); *A63F 13/497* (2014.09); *A63F 13/537* (2014.09); *A63F 13/63* (2014.09); *G11B 27/031* (2013.01); *G11B 27/105* (2013.01); *G11B 27/32* (2013.01); *G11B 27/322* (2013.01); *A63F 2300/552* (2013.01); *A63F 2300/554* (2013.01); *A63F 2300/634* (2013.01); *H04N 21/84* (2013.01); *H04N 21/8456* (2013.01)

(58) **Field of Classification Search**
CPC G11B 27/32; G11B 27/322; H04N 21/84; H04N 21/8456
See application file for complete search history.

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FIG. 1

User A
100

User B
102

330

1062 106

1060

FIG. 2

Video stream

Other data streams

→ Time

Metadata

| A | B | C | A | D | B | A | D | C | A |

Example of Viewer 1
using a tag-filter with
search or editing
parameter C to generate
filteredgame-playing
content

Video stream

Other data streams

→ Time

A B C D C C B A A A B C D S B C A A M O O S E P U P P Y

Metadata

FIG. 3

Video stream

Other data   streams

Time

Metadata

| S | B | C | A | D | B | A | F | D | E |

Sharing
filter

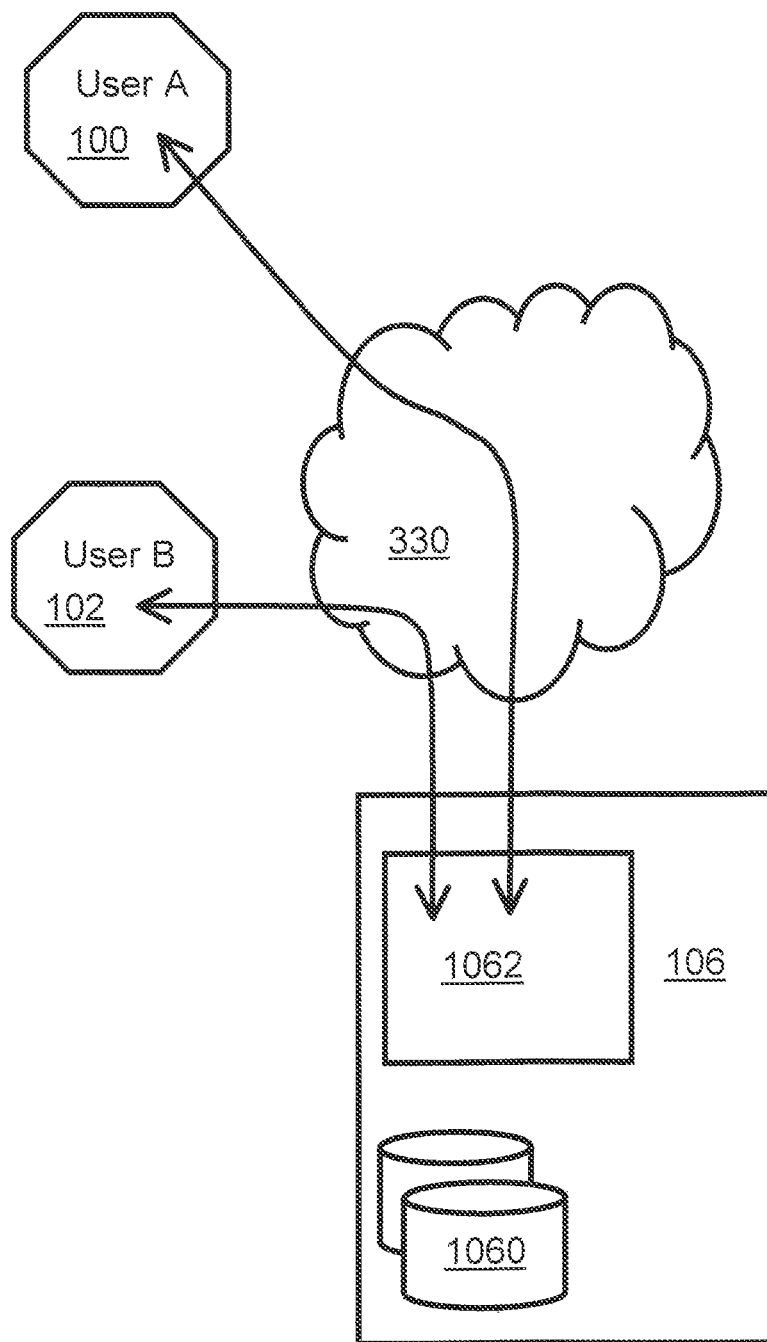Edited video
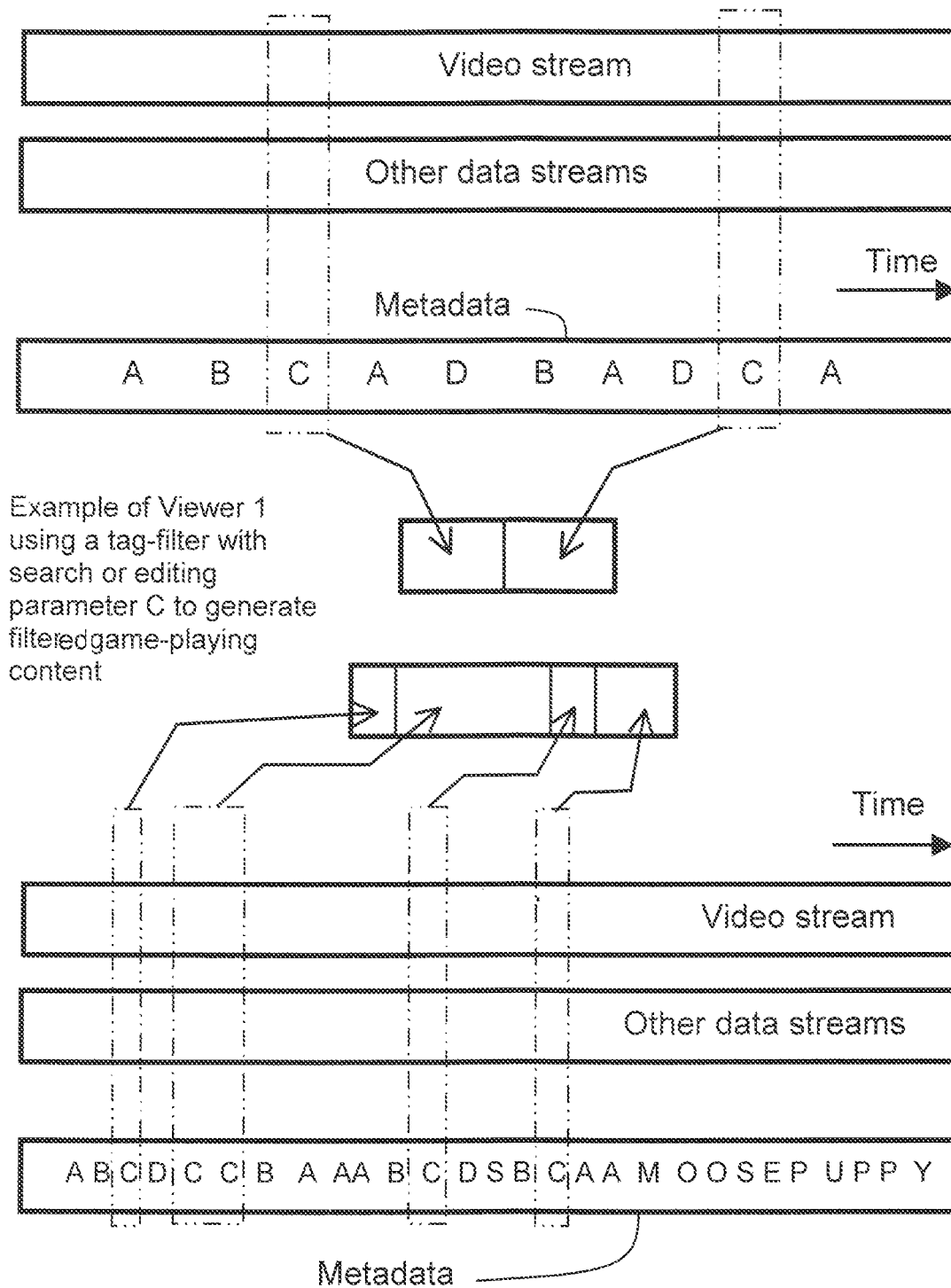
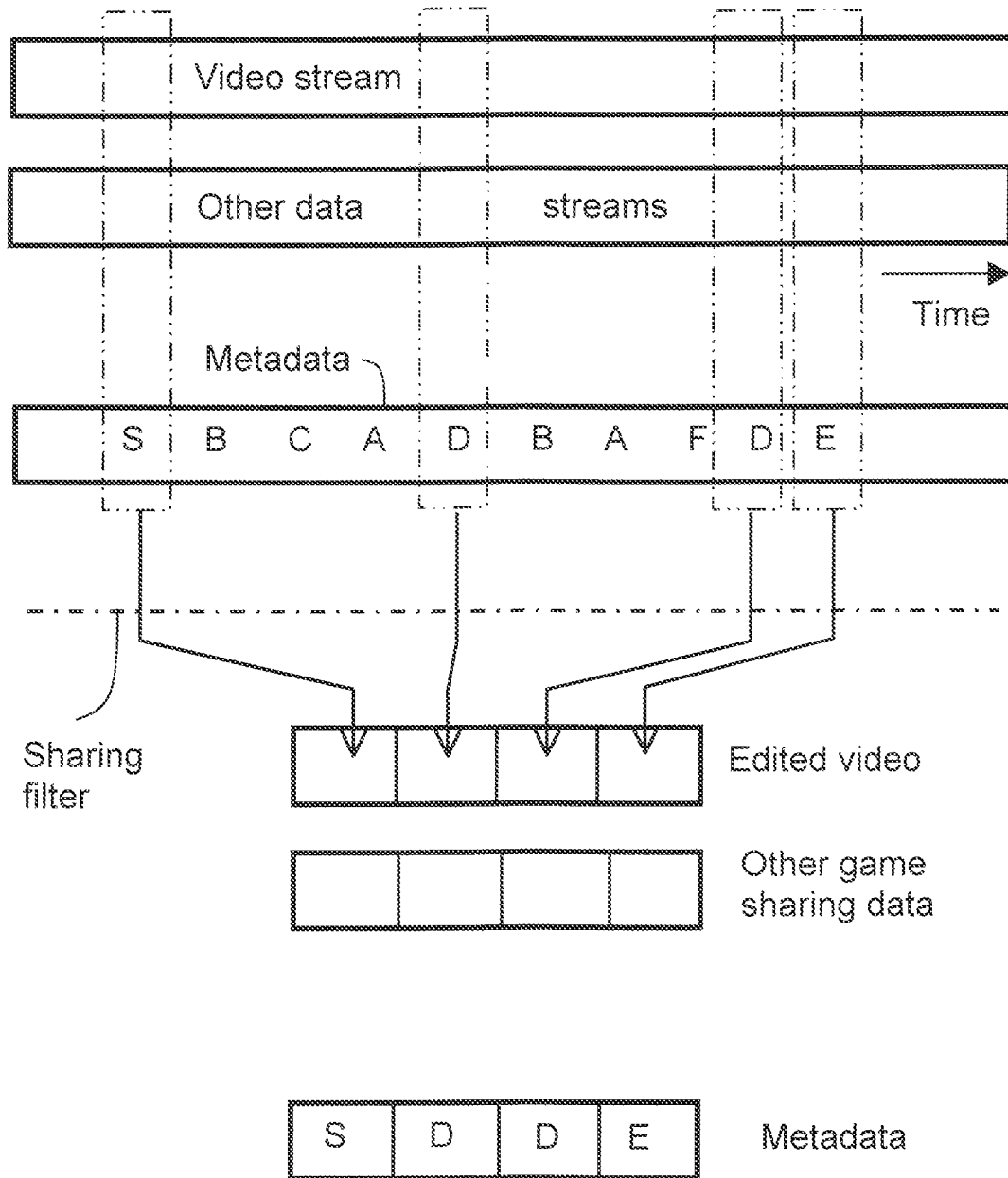Other game
sharing data

| S | D | D | E | Metadata

FIG. 4

SYSTEM AND METHOD FOR MANAGING GAME-PLAYING EXPERIENCES

FIELD

The aspects of the present disclosure relate to systems for managing game-playing experiences. Moreover, the aspects of the present disclosure also relate to methods of operating systems for managing game-playing experiences, for example for sharing game-playing experience within a social media environment. Furthermore, the aspects of the present disclosure relate to software products recorded on machine-readable data storage media, wherein the software products are executable upon or by computing hardware for implementing aforesaid methods.

BACKGROUND

Human beings naturally enjoy interacting in social groups, mutually sharing their knowledge and experience, as well as exhibiting competitive behaviour in order to define a hierarchy of respect within the social groups. Such interaction occurs in many different contexts, amongst which are included competitive sports and competitive games, including electronic games requiring player skill and aptitude. Within a given social group, it is not sufficient for a given individual merely to try to assert their position within a given hierarchy of the given social group, but requires evidence of a given degree of skill in playing games having been achieved. Similar parallels are to be found in physical sports by awarding of medals in recognition of independently-verified performance having been achieved, for example Olympic gold medals.

Electronic games are susceptible to being played within social groups, either with multiple users playing temporally simultaneously or by multiple users playing at mutually different times and then comparing their attained results, for example highest achieved scores, when playing the electronic games. However, merely comparing attained scores is not regarded socially as being most exciting, whereas highlights of game-playing resulting in highest achieved scores being achieved both proves attainment of the highest scores, as well as being inspiration to other players for improving their skills and game playing technique.

In practice, considerable time is potentially expended playing electronic games, such that recording such game-playing experiences results in considerable recorded content, which, for example, needs to be edited to filter out therefrom game playing highlights which might be of interest and inspiration to other players of the game. At present, facilities for providing such identification of highlights are not sufficiently well developed.

In U.S. Pat. No. 81,387,104B, there is described a system and method for creating, editing, and sharing video content pertaining to video game events. The method results in a relatively limited amount of metadata associated with video content pertaining to video game events being generated for enabling the events to be edited and shared with other users. For example, one set of metadata is generated which describes a game-playing encounter, instead of a stream of metadata events; the set of metadata allows mapping of metadata events directly to a timeline through one or more timestamps included in the set of metadata, thereby enabling features beneficial to implementing automated editing of recorded video content to identify interesting moments within the recorded video content based in the set of metadata.

Thus, summarizing above, sharing game-playing experiences of an original player as multiple linked streams of video content, audio content and game data enables other players to replay and thereby appreciate the original player's game-playing experiences. For contemporary electronic games, it takes a long time to replay gaming-experiences for many such games, resulting in recorded game-playing experiences of long viewing duration. Moreover, a problem encountered in practice is that it is difficult and time-consuming for a given player to edit his/her game-playing experience to include only certain types of events, for example based upon their potential interest or appeal to other players to whom the game-playing experience is to be presented. Moreover, it is also difficult for other players replaying game-playing experiences of other players to discover relevant game-playing experiences, or sub-parts thereof, by reviewing algebraic or social recommendations that are imprecise or difficult to interpret. Furthermore, contemporary searching for interesting game-playing experiences is difficult because game-playing experiences can only be searched using text descriptions entered manually by a given player desirable to appreciate other players' experiences. Additionally, even if the aforesaid difficulties are overcome, it is difficult to navigate within a given game-playing experience identified by aforementioned searching, to find interesting parts to watch.

Many game-playing experiences include events that are not immediately obvious to a casual observer, wherein the events may not be properly appreciated without graphical- or textural-highlights to draw the casual observer's attention to event detail; such graphical- or textural-highlights are beneficially implemented by way of momentary annotations and similar. Moreover, a given game-playing experience can be improved by the game-playing replaying includes visualizations of other sensor data, for example touch, microphone-captured sounds, movement sensors and similar.

A further problem encountered with contemporary game-playing systems is that video game players desire to define themselves in a content of a given type of video game and compare themselves with other players of the same game. Comparing high-level information, for example a given player's high scores and achievements when playing the given game, provides a way of comparing the given player's performance with that of other players, but provides relatively little comparative information, for example gaming prowess, style of game-playing, and preferences when playing the given game. Such limitations when contemporarily making comparisons between players hinders the given player trying to connect with other players within or among a social network, for example other players who are interesting to competing again in a given social network or whose game-playing experiences are interesting to watch and appreciate.

SUMMARY

The aspects of the present disclosure seek to provide a system for managing game-playing experiences, for example for enabling improved highlighting, searching of interesting game-playing events, and improved comparison between game-playing experiences of a plurality of game-playing participants within a social network, and programmatically editing game-play experience replays. Additionally the aspects of the present disclosure seek to provide a system for identifying from the game-playing experience interesting events. Additionally the aspects of the present

disclosure seek to provide a system for recording game-events and related metadata for the game.

Moreover, the aspects of the present disclosure seek to provide an improved method of managing playing experiences, for example for enabling improved searching of interesting game-playing events, and improved comparison between game-playing experiences of a plurality of game-playing participants within a social network.

According to a first aspect of the of the present disclosure, there is provided a system for managing game-playing experiences, wherein the system includes one or more game-playing devices provided with communication interfaces for exchanging game-playing experiences therebetween, wherein each device includes computing hardware coupled to a graphical interface for presenting an interactive game thereupon, and wherein the computing hardware is operable to execute one or more game software products recorded on machine-readable data storage media for generating the interactive game, the one or more game software products include a game experience software module (GESW) for generating a stream of metadata concurrently with recording the game-playing experience substantially as presented via the graphical interface which enables the recorded game-playing experience to be subsequently managed prior to and after communication for distribution for viewing.

The aspects of the present disclosure provide the advantage in that the concurrently-recorded metadata enables the recorded game-playing experience to be more effectively and accurately managed.

Optionally, in one embodiment of the system, the metadata includes timestamps for synchronizing with timestamps included in the recorded game-playing experience.

Optionally, in one embodiment of the system, the metadata includes one or more metadata events which are searchable when another user is searching for relevant game-play experience to watch and subsequently when viewing the game-playing experience.

Optionally, in one embodiment of the system, the one or more metadata events are automatically generated by the host game through a game experience software module (GESW). Optionally, in one embodiment, the GESW can generate its own metadata without needing input from the host game. Additionally, in one embodiment, the user can enter the metadata.

Optionally, in one embodiment of the system, the communication interfaces are operable to communicate the recorded game-playing experience via a database arrangement (GESS) for selective distribution therefrom to viewers. More optionally, in one embodiment of the system, the database arrangement (GESS) is operable to generate one or more social groups of users and related properties for selective distribution of game-playing experiences therebetween.

Optionally, in one embodiment of the system, the one or more devices comprise or are implemented using at least one of: smart telephones, pad computers, tablet computers, laptop computers, personal computers, game-playing consoles.

According to a second aspect of the present disclosure, there is provided a method of managing game-playing experiences in a system, wherein the system includes one or more game-playing devices provided with communication interfaces for exchanging game-playing experiences therebetween, wherein each device includes computing hardware coupled to a graphical interface for presenting an interactive game thereupon, and wherein the computing hardware is operable to execute one or more game software

products recorded on machine-readable data storage media for generating the interactive game, characterized in that the method includes:

(a) arranging for the one or more game software products to include a game experience software module (GESW); and

(b) using the game experience software module (GESW) to generate metadata concurrently with recording the game-playing experience substantially as presented via the graphical interface for enabling the recorded game-playing experience to be subsequently managed prior to and after communication for distribution for viewing.

Optionally, in one embodiment, the method includes arranging for the metadata to include timestamps for synchronizing with timestamps included in the recorded game-playing experience.

Optionally, in one embodiment, the method includes arranging for the metadata to include one or more metadata events which are searchable when a user is searching for a game-play experience to watch and subsequently when the user is viewing the game-playing experience. Optionally, in one embodiment, new metadata might be created and added when the user interacts with the gameplay experience while watching it (or interacting with it). Optionally, in one embodiment, users can edit metadata related to their gameplay before sharing it and also after sharing it.

Optionally, in one embodiment, the method includes generating one or more metadata events automatically by the game experience software module (GESW).

Optionally, in one embodiment, the method includes operating the communication interfaces to communicate recorded game-playing experiences via a database arrangement (GESS) for selective distribution therefrom to viewers. More optionally, in one embodiment, the method includes operating the database arrangement (GESS) to generate one or more social groups of users and related properties for selective distribution of game-playing experiences therebetween.

Optionally, in one embodiment, the method includes implementing the one or more devices using at least one of: smart telephones, pad computers, tablet computers, lap-top computers, personal computers, game-playing consoles.

According to a third aspect of the present disclosure, there is provided a software product (GESW) recorded on machine-readable data storage media, characterized in that the software product (GESW) is executable upon computing hardware for implementing a method pursuant to the aspects of the present disclosure.

It will be appreciated that features of the present disclosure are susceptible to being combined in various combinations without departing from the scope of the present disclosure as defined by the appended claims.

DESCRIPTION OF THE DIAGRAMS

Embodiments of the aspects of the present disclosure will now be described, by way of example only, with reference to the following diagrams wherein:

FIG. 1 is an illustration of an embodiment of a system for managing game-playing experiences pursuant to the aspects of the present disclosure;

FIG. 2 is an illustration of data communication occurring in operation within the system of FIG. 1;

FIG. 3 is an illustration of a method of filtering game-playing experiences using associated metadata tags; and

FIG. 4 is an illustration of a method of sharing filters for filtering game-playing experiences using associated metadata tags.

In the accompanying diagrams, an underlined number is employed to represent an item over which the underlined number is positioned or an item to which the underlined number is adjacent. A non-underlined number relates to an item identified by a line linking the non-underlined number to the item. When a number is non-underlined and accompanied by an associated arrow, the non-underlined number is used to identify a general item at which the arrow is pointing.

DESCRIPTION OF EMBODIMENTS OF THE PRESENT DISCLOSURE

In overview, the aspects of the present disclosure are concerned with a system which is operable to record game-playing experiences, together with concurrently defining and recording metadata, for example a stream of metadata, pertaining to game experience actions performed by a given player when playing a game; the given player is conveniently referred to herein as being a "user" of the system. The metadata can be created by at least one of:

(i) generated by the user; and

(ii) generated automatically by software included in a game-playing terminal, wherein the software is referred to a Game Experience Recording Software (GESW) component.

The metadata, which is recorded during playing of a game and/or entered by the user, can be employed to perform at least one of:

(a) to describe a corresponding game-playing experience;

(b) to edit the game-playing experience;

(c) to annotate the game-playing experience;

(d) to highlight the game-playing experience;

(e) to execute searches;

(f) to navigate contents of the game-playing experience;

(g) to share the game-playing experience;

(h) to describe the user through his gameplay in one or multiple games; and

(i) to recommend to a user interesting other users or game-play experiences that are relevant based on the metadata collected about users and game-play experiences and correlations between those.

Moreover, on account of the metadata being linked to the user that generated the game-playing experience, as well as a given type of game from which the metadata was recorded, the metadata can be used to search for other players that are interested in the given type of game, for example in diverse social networks. Furthermore, the metadata enables various types of analyses to be performed regarding behaviour of players during game-playing experiences, for example for analysing behaviour of players under stress when playing the given type of game, for example for automated coaching services to improve playing performance of players of the given type of game.

The various embodiments of the system, and associated methods, are capable of being implemented, wherein game-playing devices are, for example, implemented as portable devices, for example wireless-enabled mobile terminals, smart phones, mobile telephones, cell phones, tablet computers, pad-computers and similar; beneficially, such game-playing devices include computing hardware with sufficient data memory capacity to accommodate the aforementioned GESW software. In FIG. **1**, there are shown component parts of a game-playing device indicated generally by **10**. The game-playing device **10** includes computing hardware (CPU) **20** coupled via a Graphical Processor Unit (GPU) **30** to a graphical display **40**. Optionally, the graphical display **40** is implemented as a touch-sensitive display which is

operable to provide spatial screen-touch tactile information back to the computing hardware (CPU) **20**, via use of a touch sensor **50** associated with the graphical display **40**. The game-playing device **10** beneficially also includes a camera **60** facing towards the user when playing a game on the game-playing device **10**, wherein the camera **60** is operable to generate a camera output signal which is coupled to the computing hardware (CPU) **20**. Moreover, the game-playing device **10** beneficially includes other sensors **70**, for example one or more of: an accelerometer, an inclination sensor, a microphone, touch controls and similar. The computing hardware (CPU) **20** is coupled to data memory **80**, either directly or via a hardware encoder/decoder **90**, for example for performing data compression. Moreover, the game-playing device **10** includes a wireless interface **95** for enabling the computing hardware **20** to communicate via a wireless communication network to databases and/or to game-playing devices of other users.

In operation, game-playing software is executed upon the computing hardware (CPU) **20**, and graphical presentations to the user are generated by the Graphics Processor Unit (GPU) **30** in response in instructions received from the computing hardware (CPU) **20**. The game is presented to the user via the graphical display **40**. In addition to the aforesaid game-playing software, for example proprietary third-party software provided by well-known games-software companies, the computing hardware (CPU) **20** is operable to execute Game Experience Recording Software (GESW), wherein GESW includes a set of software library components. During development of software for the game-playing device **10**, a software developer uses GESW components as an integral part of the game, namely by way of a single monolithic software application, namely for providing a host software application which includes features for integrated recording, sharing and playback of a game-playing experience together with concurrently-recorded metadata.

Beneficially, the GESW includes an Application Program Interface (API) which is operable, when executed upon the computing hardware (CPU) **20**, to capture, namely to take a "snap-shot", of information contents of the Graphics Processor Unit (GPU) at any given time when playing a game on the game-playing device **10**; in other words, the API is operable capture rendered presentation images provided on the graphical display **40** to the user. Optionally, the captured images are directed through the hardware encoder/decoder **90** to the data memory **80** for storage therein. Beneficially, the game software can be used to control the API to capture images which are different to the rendered image presented to the user via the graphical display **40**; for example, the game software is operable to exclude certain user-interface graphical elements which are irrelevant or distracting to other users when watching capture game-playing experience generate by the given user of the game-playing device **10**.

As aforementioned, the game-playing device **10** optionally includes the camera **60** which is disposed upon a front face of the device **10**, namely on a similar face of the device **10** as the graphical display **40**; the GESW is beneficially operable when executed upon the computing hardware (CPU) **20** to record video images of the user when he/she is playing a game for which metadata is concurrently being generated. Optionally, the video images are presented in a sub-field, for example a window, in the graphical display **40** whilst the user is engaged in game-playing activities. Such captured video of the user is beneficially directed though the encoder/decoder so that data storage capacity of the data memory **80** is used in a sparing manner, by way of compressing the video images.

Optionally, the GESW is configurable to record user gestures, namely User Interface data (UI data), entered by the user via the graphical display **40** implemented as a touch-screen, and also as sensed (Sensor Data) by one or more of the sensors **70**, for example acceleration, orientation of the device **10** as measured using a magnetometer, location of the device as measured using satellite GPS or cellular-network GPRS, temperature of the game-playing device **10** and so forth; there is thereby recorded game-control gestures (Game Control). The GESW is also optionally configurable to capture via microphone sounds (Mic Sound) generated by the user that accompany playing of a game. Moreover, the GESW is optionally also configurable to record game sounds (Game Sound), for example explosion sounds, gun-fire sounds, beeps and such like, in a separate audio content stream stored in the data memory **80**, for example in data-compressed form.

The GESW is also configurable to replay, for example to the user of the game-playing device **10**, recorded game-playing events, for example events resulting in achievement of a high score, successful completion of a task in a given game, user's "death" in a given game, or other types of events arising from the user's interaction with the game hosted by, or via, the game-playing device **10** (Game Events) or statistical information (Game Stat) pertaining to the user's playing of games on, or via, the device **10**. The game software executed on the device **10** can, via the aforesaid API, be configured to add, remove and annotate game events (i.e. annotate Game Events), for example in real time during playing of games, in response to the user's control of the game, for example provide personalized congratulatory messages in the recording of the game-playing experience. There is thereby provided a user-friendly manner of editing and/or selecting which parts of a recorded game-playing experience are to be shared with other users, for example within a given social environment; for example, the user, after playing a given game, can select which parts of the highlights of the game-playing experience are to shared with other users.

Information recorded whilst the user plays the given game (namely one or more of: UserFace Video, Game Video, Mic Sound, Game Sound, Game Control, Game Stat, UI Data, Game Events, and similar) are recorded in the data memory **80**, although later downloading of the recorded data via the wireless interface **95** to a remote server (Experience Server) for further distribution therefrom to other users is optionally accommodated; such communication is beneficially implemented via Wi-Fi or cellular wireless communication networks, for example via contemporary 3G or 4G wireless communication networks. All data recorded in the data memory **80** pertaining to a given game-playing experience are mutually linked by way of time stamping of the recorded data. As aforementioned, selection and management of recorded data generated by the game-playing experience is handled by the GESW, namely by one or more of its library of software components; for example, the GESW includes the API which can be employed by a games developer to set rules for recording and sharing of recorded game-playing experiences stored in the data memory **80**.

Thus, referring to FIG. **2**, the device **10** is represented by a gaming terminal A **100** which can be configured to send all, or a sub-set thereof, of the recorded content stored in the data memory **80** to a Game Experience Sharing Service (GESS) **106**. The GESS **106** includes one or more data servers **1062** and a database **1060**. Moreover, the one or more servers **1062** are optionally spatially co-located or, alternatively, spatial distributed between a plurality of mutually remote

sites. Uploaded recorded data from the gaming terminal A **100** is stored in the database **1060** of the GESS **106**.

Sharing of recorded data corresponding to game-playing experiences beneficially occurs via the one or more servers **1062**, whereat the recorded data is optionally transcoded to various bitrates appropriate for recipient devices whereat the game-playing experience is to be presented to other users. Optionally, sharing of the recorded data, for example from the device A **100** to a recipient device B **102**, occurs via one or more point-to-point data connections established within a communication network, alternatively via one or more peer-to-peer communication links, or any combination thereof.

A user of the device B **102** is able, subject to credentials and settings which control sharing rights, to access the GESS **106**; the settings which control sharing rights optionally include settings such as "share to all", "share to friends", "private" and so forth. Optionally, the user B **102** has at least one game installed in his/her game-playing device B **102** which has a GESW which is compatible with the GESW of the device A **100**; the game of the device B **102** is optionally the same as the game of the device A **100**, alternatively optionally mutually different. A user of the device B **102** is thereby able to record game-playing experiences in a substantially similar manner to the user of the device A **100**. Optionally, the GESS provides an interface which is accessible via standard contemporary browser software, for example contemporary FIREFOX™, SAFARI™, INTERNET EXPLORER™, CHROME™ and similar.

As aforementioned, the GESW includes a library of software components and is beneficially implemented as a software module, wherein the GESW module, when executed upon computing hardware, enables game-playing experiences to be recorded automatically whilst the given user plays a game, and wherein such automatic recording includes generation of corresponding metadata. Moreover, the GESW module is operable when executed to record multiple streams of data corresponding to the game-playing experience, namely one or more of:

(a) GameVideo: video content corresponding to the game;

(b) GameAudio: audio content corresponding to the game;

(c) FaceCamera: video content of the user's face captured using the camera **60** during game-playing activities;

(d) Microphone: audio content generated by the user captured during game-playing activities;

(e) Touch screen sensors: content corresponding to the user touching the graphical display **40** during game-playing activities; and

(f) Movement sensors: content corresponding to sensing executed by the one or more sensors **70**.

Each of the multiple streams of data has sets of metadata associated therewith, for example for enabling highly precise analysis, editing and searching of the streams of data to be performed, namely advanced management thereof. As aforementioned, the GESW module records the stream of metadata arising from the recorded game-playing experience, wherein the metadata is time-stamped to enable it to be synchronized to other recorded streams of data in (a) to (f) above.

The aforesaid metadata stream includes one or more metadata events (Metadata Events); each metadata event is a data structure which describes something that has happened during the game-playing experience or in a user-environment hosted by the device **10**, mutatis mutandis by the terminals A **100**, B **102**. Such metadata events beneficially describe one or more of:

(i) events that are invisible to the user of the device **10** when playing a game thereupon, for example a metadata event describing an internal state of the game, for example an increase in difficulty level based upon adaptation to a skill of the user;

(ii) events that are visible to the user of the device **10** when playing a game thereupon, for example a metadata event describing the user passing a checkpoint or killing a monster in the game hosted by the device **10**;

(iii) events that describe a state of the game being played by the user on the device **10**, events that describe the user, and events which describe the device's computing environment, for example increased volume of a microphone signal generated by a microphone included amongst the one or more sensors **70** which is indicative of the user shouting excitedly and/or rapid frequency of tapping by the user on the graphical display **40** when implemented as a touch-sensitive display; and

(iv) events that are recorded in response to explicit instructions from the user to create one or more events, for example a user taps a button on the graphical display **40** to indicate that a meaningful moment or event has occurring during playing of the game.

However, it will be appreciated that the user is able to add additional metadata to the recorded game-playing experience, after completion of initially generating the game-playing experience using the device **10**. The additional metadata can be recorded by explicit instruction from the user of the device **10**, and include specific data entered by the user, for example metadata indicative of a number of times the user has played the given game (i.e. experienced or novice player). Beneficially, such metadata is can be automatically stored on the GESS and later associated with the user's profile, for example to support searching and analysis of algorithmic discovery of relevant game-playing

experiences, as well as to provide personalized features for the user, for example medals, awards and achievement recognition for the given user.

In structure, the metadata events each include multiple data items or elements, for example spatial data points, that describe their associated game events. Certain of the data items or elements are beneficially in a standardized format which enables them to be compared with other data from other types of games, whereas other data items or elements can be specifically defined by a game developer who developed the game for examples of the device **10**, for example for a specific type of smart phone model. The data items beneficially include one or more of: player coordinates in a coordinate system defined by the game, coordinates of an image of a monster presented on the graphical display **40**, text annotations, importance level of the event, and so forth.

Metadata events, and each data item or element associated therewith, can be defined to be "visible" or, alternatively, "invisible", such that certain metadata events are only used by a developer during development and debugging of the game or the GESW or GESS systems to operate the system and to e.g. optimize distribution of game-play experiences to relevant users or identify errors or low performance within the system itself, whereas visible data items or elements can be employed for searching purposes, discovery purposes, content sharing purposes, and user-editing purposes. Optionally, metadata data items or elements are defined to be user-editable, thereby enabling the user to create, edit and modify associated metadata events. Alternatively, a given metadata event is non-editable by the user, for example a high score, where authenticity of the data item or element must be ensured. Optionally, the user is able to set any metadata tag to any place on the game-playing experience; more optionally, the one or more metadata tags are selected by the user from a set of pre-defined metadata tags, such as shown in the non-limiting example of Tables 1 and 2:

TABLE 1

Examples of game-event tags

Metadata tag	Description	Notes
"GameOver"	End-of-game related tag	This tag can be associated in the game software to certain limited resources, for example a number of "lives" that the user is able to consume when playing the game.
"HighScore"	Defines a moment in time when the user attained a high score when playing the game	This tag can be associated in the software to a moment in time when a given score A is greater than another given score B. Optionally, the scores A and B can pertain to a number of game points or a number of collected credits.
"Fight"	Defines a moment in time when game objects are mutually interacting for mutually defeating one another	This tag is associated in the software to be triggered when a given object A of the game is within a certain spatial distance, in equivalent spatial units of the given, from a given object B of the game, or in an event that the objects A, B are exchanging information.
"Start"	Defines a moment in time when playing of the game is commenced.	This tag is beneficially associated with starting of the game, or a moment in time when the user first executes any actions in respect of the game.
Etc.	Etc.	Etc.

TABLE 2

Examples of sensor-based tags

Metadata	Description	Notes
"HighG"	Defines a moment when sensors 50, 60, 70 of the game-playing device 10	This tag is beneficially associated with any actions, for example when measured acceleration exceeds a pre-defined acceleration threshold.

TABLE 2-continued

Examples of sensor-based tags

Metadata	Description	Notes
	sense considerable movement of the device 10, for example in an event that the user casts the device 10 in a moment of frustration or winning ecstasy	
"HotGaming"	Defines a moment in time when it is likely that the user is playing a game on the game-playing device 10 in a manner which is too intensive	This tag is beneficially associated with a temperature sensor and/or humidity sensor of the game-playing device 10, and is automatically set when a temperature and/or a humidity sensed exceeds one or more pre-defined threshold values, or a temporal rate of change in the temperature and/or the humidity exceeds one or more pre-defined threshold values.
"Dark"	Defines an ambient illumination level in a physical environment in which the game-playing device is employed when in operation	The tag is beneficially associated with a illumination intensity sensor, for example implemented by way of the camera 60, for monitoring the illumination level surrounding the game-playing device 10 when in use.
Etc.	Etc.	Etc.

Filtering and editing of recorded game-playing experiences will now be described, for example executed by the given user before his/her game-playing experience is broadcast to other users via the aforesaid GESS. Once recording of the game-playing experience has been completed on the device 10 by the GESW, it is then available to be replayed by the user of the device 10; the metadata stream enables the user to navigate the game-playing experience for editing one or more sections of the game-playing experience, as appropriate. Such editing can be additive, namely the user adds additional information, for example additional metadata, or can be subtractive, namely the user deletes potentially uninteresting portions of the game-playing experience, for example by inserting user-programmable hops, namely fast forward or faster reverse, over uninteresting portions of the game-playing experience, for example merely to concentrate on highlights of the game-playing experience, or by removing portions of the content from the game-play experience. Moreover, the metadata can be configured by the GESW to control a manner in which the user, or other users can access the game-playing experience; for example, the metadata can be used by the GESW to customize how the user, or other users, are prompted to watch the recording of the game-playing experience by selecting which recorded game-playing events are highlighted to the user or other users, for example a thumbnail image is selected to be shown from a point in the recording whereat the user demonstrates a high degree of skill, and to customize the text prompting the user to access the recording, for example:

"You have reached level 5—show your friends how you killed the Moosepoodle monster!"

wherein the prompt is generated by analysing the Metadata Events to highlight the most meaningful moments that the user experience during playing of the game.

Thus, the metadata is employed, when the user accesses the recording of the game-playing experience, to provide a better quality of viewing experience, as well as a better editing experience. Moreover, as aforementioned, the metadata provides for better navigation within the game-playing experience, for example to navigate between interesting moments in the game-playing experience by tapping "back" and "forward" buttons that allow fast-forward and fast-reverse through the game-playing experience and resumption of playing when a highlight is reached, as defined by the metadata. Optionally, the user can be presented by the GESW with a graphical timeline of the game-playing experience, wherein the timeline includes one of more symbols therealong corresponding to one or more highlights defined in the metadata. Moreover, the metadata is susceptible to being edited to add special features, for example "liking" or "voting" or "commenting" features, for other users to provide feedback, for example via the GESS, regarding whether or not they like the game-playing experience or parts thereof; optionally, the GESS collates statistical data pertaining to such feedback.

Beneficially, when the user is editing the recorded game-playing experience, in one embodiment, the corresponding recorded metadata stream is employed to split the recorded game-playing experience into segments, wherein each segment is created to correspond to an associated Metadata Event, and wherein the Metadata Event defines a starting point and an ending point of the segment. Optionally, data points stored in the Metadata Event are used to describe each segment, for example annotating the segment, for example "Last Battle of the Moosepoodle Monster against the Basque Trolls". Dividing the game-playing experience into segments assist the user to navigate the game-playing experience, for example to identify which segments are to be edited, for example deleted, annotated and so forth as described in the foregoing examples.

The device 10 and its GESW, for example in combination with the GESS, provide a game-playing system which provides an automatic editing function that employs editing rules defined at system-level, wherein the editing rules are extended and customized depending upon type of game and user-preferences, for automatically editing the recorded

game-playing experience. Non-limiting examples of editing rules are provided in Table 3 as follows:

TABLE 3

Examples of editing rules	
Rule	Notes
"If the user reaches a high score, then a segment associated with attaining the high score should be preserved (namely not deleted) and a highlight annotation should be added to the metadata of the preserved segment"	
"Define that all segments where the Metadata Event's importance data is less than a pre-defined minimum are to be automatically removed from the recording of the recorded game-playing experience"	For reducing a size of the recording in the data memory 80, for example for freeing data storage capacity for other purposes.
"Segment should be fast-forwarded at x4 speed if the Metadata Event's importance data is set to a medium value"	

Optionally, in one embodiment, after an automatic edit has been executed by the GESW, the user is able to employ the GESW to edit and fine-adjust the initially automatic edit performed by the GESW.

When the user is desirous to share his/her recording of a game-playing experience, the Metadata Stream is shared via the GESS, together with a remainder of data pertaining to the game-playing experience. The recording of the game-playing experience is uploaded to the GESS and, there, the Metadata Stream is analyzed by the GESS and used to describe automatically the uploaded recording of the game-playing experience.

When another user, for example a spectator user, is accessing the GESS, he/she can find a selection of game-playing experiences to watch in a plurality of different ways, including shares from pertinent social group connections, as well as being able to perform algorithmic searches of the game-playing experiences and receive various recommendations. The Metadata collected by the GESS is optionally combined with data collected from the user's behaviour within the GESS for further personalizing game-playing experiences provided via the GESS. Moreover, the user can be provided with a social feed regarding game-playing experiences which have been shared by other users with a given user, wherein the social feed is susceptible to being adapted to characteristics of the given user, for example his/her game-playing competences and scoring abilities as recorded by the GESS.

When a given user finds, via the GESS, an interesting game-playing experience to watch, the Metadata Stream associated with the game-playing experience is used to provide navigation within the game-playing experience when presented to the given user, for example for navigating back and forth between interesting, highlighted events, for example by employing a visual timeline where key events are highlighted.

Referring to FIG. **3**, there is shown an example of a viewer **1** wanting to see game-playing experiences with a given metadata tag "C". The viewer **1** access the GESS **106** and is desirous to watch a game-playing experience of a given player A and a player B. Both players A, B have shared the entire game-playing experience, including associated metadata.

Referring to FIG. **4**, there is shown an example of employing filters for enabling creation of an edited version of game-playing experiences in an automated manner. A

sharing filter, for example, is optionally able to select a defined set of tags, for example tags "S", "D", "E" pertaining to the game-playing experience. There is thereby provided functionality for generating exciting annotated gameplay experiences for viewing.

Modifications to aspects and embodiments of the present disclosure described in the foregoing are possible without departing from the scope of the invention as defined by the accompanying claims. Expressions such as "including", "comprising", "incorporating", "consisting of", "have", "is" used to describe and claim the aspects of the present disclosure are intended to be construed in a non-exclusive manner, namely allowing for items, components or elements not explicitly described also to be present. Reference to the singular is also to be construed to relate to the plural. Numerals included within parentheses in the accompanying claims are intended to assist understanding of the claims and should not be construed in any way to limit subject matter claimed by these claims.

The invention claimed is:

1. A system for managing game-playing experiences, comprising:

a game playing device configured to execute an interactive computer game, record an execution of the computer game and record an image of a user of the game playing device during execution of the computer game, the recorded execution of the computer game and image of the user during execution of the computer game comprising a gameplay experience;

the game playing device comprising computing hardware coupled to a graphical interface for presenting the interactive computer game thereupon, and wherein the computing hardware is configured to execute a game software product recorded on machine-readable data storage;

the game software including a game experience software module (GESW) for generating first metadata concurrently with recording the game-playing experience substantially as presented via the graphical interface which enables the recorded game-playing experience to be subsequently managed wherein the GESW operates to add, remove, and annotate game events in real time in response to the user's control of the computer game, concurrently with recording the game-playing experience;

wherein the GESW operates to exclude certain user interface graphical elements concurrently with recording the game-playing experience.

2. The system as claimed in claim **1**, wherein the first metadata includes a metadata stream comprising one or more metadata events comprising data structures that:

are invisible to the user during execution of the computer game;

are visible to the user during execution of the computer game;

describe a state of the computer game being executed; or

are recorded in response to instructions from the user.

3. The system as claimed in claim **1**, wherein the GESW operates to add second metadata added by the user to the recorded game-playing experience.

4. The system as claimed in claim **3**, wherein the second metadata includes one or more tags used to select the recorded game-playing experience for subsequent viewing.

5. The system as claimed in claim **1**, wherein the GESW operates to capture images concurrently with recording the game-playing experience that are different from a rendered image presented to the user via the graphical interface.

6. The system as claimed in claim **1**, wherein the GESW operates to automatically edit the recorded game playing experience according to pre-defined editing rules.

7. The system as claimed in claim **1**, wherein the GESW operates to record user gestures during execution of the computer game.

8. The system as claimed in claim **7**, wherein the user gestures comprise one or more of user interface data entered by the user via a graphical display of the game playing device.

9. The system as claimed in claim **7**, wherein the user gestures comprise data sensed by one or more sensors of the game playing device, including one or more of acceleration, orientation, location, and temperature of the game-playing device.

10. A method of managing game-playing experiences in a system, the system comprising a game-playing device including computing hardware coupled to a graphical interface for presenting an interactive computer game thereupon, and wherein the computing hardware is configured to execute one or more game software products including a game experience software module (GESW) recorded on machine-readable data storage media for generating the interactive computer game, wherein the method comprises:

configuring the game playing device to execute the computer game, record an execution of the computer game, and record an image of a user of the game playing device during execution of the computer game, wherein the recorded execution of the computer game and image of the user during execution of the computer game comprise a gameplay experience;

using the GESW to generate first metadata concurrently with recording the game-playing experience substantially as presented via the graphical interface for enabling the recorded game-playing experience to be subsequently managed;

using the GESW to add, remove, and annotate game events in real time in response to the user's control of the game, concurrently with recording the game-playing experienced; and

using GESW to exclude certain user interface graphical elements concurrently with recording the game-playing experience.

11. The method as claimed in claim **10**, wherein the first metadata includes a metadata stream comprising one or more metadata events comprising data structures that:

are invisible to the user during execution of the computer game;

are visible to the user during execution of the computer game;

describe a state of the computer game being executed; or

are recorded in response to instructions from the user.

12. A method as claimed in claim **10**, comprising using the GESW to add second metadata to added by the user to the recorded game-playing experience.

13. A method as claimed in claim **12**, wherein the second metadata includes one or more tags used to select the recorded game-playing experience for subsequent viewing.

14. A method as claimed in claim **10**, comprising operating the GESW to capture images concurrently with recording the game-playing experience that are different from a rendered image presented to the user via the graphical interface.

15. A method as claimed in claim **10**, comprising using the GESW to automatically edit the recorded game playing experience according to pre-defined editing rules.

16. The method as claimed in claim **10**, comprising using the GESW to record user gestures during execution of the computer game.

17. The method as claimed in claim **16**, wherein the user gestures comprise one or more of user interface data entered by the user via a graphical display of the game playing device.

18. The method as claimed in claim **16**, wherein the user gestures comprise data sensed by one or more sensors of the game playing device, including one or more of acceleration, orientation, location, and temperature of the game-playing device.

19. A computer program product recorded on a non-transitory machine readable medium executable on computing hardware to cause the hardware to execute the method comprising:

configuring the game playing device to execute the computer game, record an execution of the computer game, and record an image of a user of the game playing device during execution of the computer game, wherein the recorded execution of the computer game and image of the user during execution of the computer game comprise a gameplay experience;

using the GESW to generate first metadata concurrently with recording the game-playing experience substantially as presented via the graphical interface for enabling the recorded game-playing experience to be subsequently managed;

using the GESW to add, remove, and annotate game events in real time in response to the user's control of the game, concurrently with recording the game-playing experience; and

using GESW to exclude certain user interface graphical elements concurrently with recording the game-playing experience.

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